



SOLID WASTE MANAGEMENT - GS III MAINS

Q. Solid Waste Management is filled with the twin issues of population increase and the emergence of megacities. Critically examine the issues faced by the urban local bodies in managing solid waste in India. (15 marks, 250 words)

News: *Municipal bye-laws are underutilised legal instrument for instituting sustainable solid waste management in cities*

What's in the news?

- In its pursuit to gauge the efficacy of how municipal bye-laws are being used by Indian cities to effectively enforce legal measures towards circular economy in solid waste management (SWM), Delhi-based think tank Centre for Science and Environment (CSE) initiated a national scale study encompassing 37 cities from the cross-sections of east, west, north and south India.

Key takeaways:

- Urban India generates nearly 160,000 tonnes of waste per day.
- As per Central Pollution Control Board report 2020-21, only 50 percent of the collected waste gets processed and 18 percent of the collected waste gets dumped 31 percent remains unaccounted.
- It gets piled up in various places, causing air land and water pollution and contaminating marine ecosystems by finding its way to the oceans through the land to sea pathways.

Solid Waste Management and Urban India:

- In urban India, solid waste management (SWM) has become one of the biggest development challenges. Numerous studies show that improper waste disposal produces hazardous gases and leachates as a result of microbial decomposition, environmental factors, and land-filling practices.
- India produces more than 1,50,000 tons of Municipal Solid Waste (MSW) each day, with Mumbai ranking as the fifth most wasteful city in the world. However, only 83% of waste is collected, and only 30% of that is processed.
- A key component of sustainable Metropolitan growth is **Municipal Solid Waste Management (MSWM)**. To reduce its damaging effects on the environment, solid waste is separated, stored, collected, moved, transported, processed, and disposed of. Unmanaged MSW contributes to the spread of a wide range of illnesses.



Disposal of Solid Wastes:

1. Largest part went to Landfills:

- Half the municipal solid waste went to landfills and the other half was recycled and reused.

2. Incineration:

- About 35% of bio-medical waste was incinerated, while the entire share of construction and demolition waste was recycled.
- While bio-medical waste is incinerated, the ash generated after the process is sent to the landfills.

3. No Information on E-waste:

- It is not known how e-waste is disposed of as there is no treatment and disposal facility available in Delhi for e-waste.

4. Plastic into Energy:

- According to the report, of the 610 tonnes of e-waste generated in 2020-21, refurbish collectors collected 28.6 tonnes and bulk consumers collected the rest.
- Notably, about 22% of plastic waste is converted into energy, while 37% is taken to landfills.

Impacts of Improper Waste Dumping:

1. Environmental Impact:

- Release of methane from decomposition of biodegradable waste under anaerobic conditions which can cause **fires and explosions**. It is also a major contributor to **global warming**.
- Problem of **odour** especially during summers.
- **Migration of leachates** to receiving water.

2. Health Impact:

- Uncontrolled burning of waste releases fine particles which are a major cause of **respiratory disease and cause smog**.
- Dumping sites provide **breeding sites for mosquitoes** thus increasing the risk of diseases such as malaria, dengue.

Challenges in waste management in India:

1. Segregation & Collection:

- Segregation is rare to find, so **unsorted waste** is typically collected by municipalities daily with the help of the **inadequate number of staff**.
- Collection of waste is done door to door from highly **congested** and narrow streets on manual bases.

2. Storage & Transportation:

- The residents often utilize the single bin for mixed waste, often found unmanaged, filled with leachate, especially during the rainy season.



- The solid waste collection vehicles visit on a weekly basis; where vehicles seem uncovered, holding inadequate capacity, also utilizing traditional and manual collection methods in most of the cities.
- The **scarcity of land for waste dumping** is even a more challenging issue.

3. Treatment and Final Disposal:

- Municipalities are struggling with their **unmanaged waste treatment process**.
- The most significant challenge faced by recycling plants is its heterogeneity.
- As a result, it is difficult to treat solid waste to generate bio-methanation, waste to energy.

4. Policies & its Awareness:

- The general awareness of solid waste management is quite low due to a **lack of self-motivation and attitude**.
- The citizens usually discard waste from their house without segregation, which further makes it challenging for the waste collector to distinguish the waste type.
- It's not only about their education, but also **social taboos** prevailing in society towards waste doesn't allow them to behave responsibly towards waste.

5. Unplanned Fiscal & Investment Approaches:

- Despite high investment in waste in the last decades, authorities are failing all the time because of **unplanned management and investment**.
- It has even noticed that municipalities are **spending less on the segregation, treatment process while more on the sweeping, collection and transportation**.

6. Inadequate Resources & Land:

- A high density of the population in the cities creates a shortage of available land for the necessary amenities, which indicates the projection of a vast land requirement for the disposal of waste in the upcoming years.
- High solid waste generation among the urban regions will require an additional 1400 Sq. Km., by the year 2047.
- A regular uncontrolled hike in land prices makes it more challenging to manage land availability.

7. Unorganized Informal Sector of Waste:

- Municipalities are mostly struggling to handle the vast waste with the untrained and unorganized waste sector.
- The adequate machinery and tools are found missing and lack of funds and fiscal amenities.
- The Informal sector has a significant value in the waste material reduction, reuse and recycling, low and middle-income countries like India.



Government Initiatives:

1. Swachha Survekshan:

- An **annual survey of sanitation, hygiene and cleanliness** in Indian cities and towns is known as the Swachha Survekshan.
- Under the Ministry of Housing and Urban Affairs, it debuted as a component of the **Swachh Bharat Mission - Urban (SBM-U)**. It awards cities and towns with no trash stars based on a number of criteria.

2. Swachhata Hi Sewa Campaign:

- It promoted cleanliness by involving all relevant parties in the **“Jan Andolan” (National Movement)**.

3. Compost Banao:

- A multi-media campaign called Compost Banao, Compost Apnao was launched by the Ministry of Housing and Urban Affairs on **waste-to-compost** under Swachh Bharat Mission – Urban (SBM- U).
- The intention was to get people to compost their kitchen scraps so that less garbage ends up in landfills and can be used as fertilizer.

4. Promotion of Waste to Energy:

- The Ministry of New and Renewable Energy (MNRE) established the Program on Energy from Urban, Industrial, Agricultural Waste/Residues, and Municipal Solid Waste to support the establishment of Waste-to-Energy projects and to provide centralized financial support.

5. Solid Waste Management Rules (SWM), 2016:

- Solid Waste Management Rules (SWM), 2016 replaced the Municipal Solid Wastes (Management and Handling) Rules of 2000.
- These rules are now applicable beyond municipal areas to urban agglomerations, census towns, notified industrial townships, areas under Indian Railways control, airports, air bases, ports, and harbors, defense establishments, special economic zones, State and Central government organizations, pilgrimage sites, and sites of religious and historical significance.
- The 2016 Solid waste management rules place a strong emphasis on the separation of waste at source, manufacturer responsibility for packaging and sanitary waste disposal, and user costs for bulk generator collection, disposal, and processing.
- **Segregation of waste at the source:** Now it is the responsibility of generators to segregate the waste at the source into three types:
 - Wet (biodegradable)
 - Dry (plastic, paper, metal, wood, etc.)
 - Domestic hazardous wastes (diapers, napkins, empty containers of cleaning agents, mosquito repellents, etc.)
- Segregated wastes should be handed over to authorized rag-pickers or waste collectors or local bodies.



- **Integration of waste pickers/ rag pickers** and waste dealers in the formal system. This is to be done by State Governments, and Self-Help Group, or any other group to be formed.
- Generators will have to pay ‘**User Fee**’ to waste collectors and ‘**Spot Fine**’ for Littering and Non-segregation.
- **Biodegradable waste** should be processed, treated, and disposed of on-site using composting or bio-methanation. The remaining trash should be given to the waste collection service or agency as directed by the local authorities.
- In order to oversee the entire application of the legislation, the government has also formed a **Central Monitoring Committee**, which is led by the secretary of the Ministry of Environment, Food, and Climate Change.
- The **Rules for the Safe Treatment of Legacy Waste** require the use of bioremediation and bio-mining at all open dumpsites and currently operational dumpsites in India.

6. Duty of the Citizens:

- In addition, every Indian citizen is required under **Article 51 A (g)** of the Indian Constitution to safeguard and enhance the natural environment, including forests, lakes, rivers, and animals, as well as to exhibit compassion for all living things.

WAY FORWARD:

1. Research and development:

- In order to rebuild India’s waste management system, research and development should be encouraged. Recycling and recovery from garbage should be prioritized over landfilling.
- Additionally, it’s critical to promote e-waste recycling in order to address the issue of e-waste.

2. Public-Private Partnership methods for trash management should be promoted.

3. Biological management:

- **Both biomining and bioremediation** are excellent, straight forward processes that are not only economical but also environmentally friendly. The land that was formerly a landfill can be made available for alternative uses.
- In areas where they are appropriate, it is crucial to make biomining and bioremediation mandatory. Municipalities shouldn’t have the authority to determine whether or not there are geographical restrictions on the application of these tactics.

4. Decentralization:

- Decentralization of waste management is crucial.
- Two excellent examples of this are Ambikapur in Chhattisgarh and Vellore, where waste was collected, decentralized, composted naturally, and then planted.

5. Kasturirangan Committee Recommendations:

The Kasturirangan report by Planning Commission has also highlighted the need for an integrated approach to combat Solid waste through:



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- Principle of **Reduce, Reuse, Recover, Recycle and Remanufacture (5Rs)** should be adopted.
- Motivate Resident Welfare Associations (RWA), CBO / NGO's to take up work of community awareness and door to door collection.
- It emphasizes setting up centralized (for incineration, gasification, pyrolysis) or decentralized (for biomethanation, vermicomposting) waste processing facilities keeping in view the quantity and quality of waste generated and financial viability of the processing technology.
- Standard protocols for landfill management to prevent accidents: Set up Common Regional Sanitary Landfill Facility, to reduce the land requirement. Cities above a population of one million should set-up their own landfill and permit all cities and towns within 50km periphery of the city to use the facility for disposal of their waste.

Solid Waste Management is a significant issue in India due to population increase and, in particular, the emergence of megacities. India now relies on an insufficient garbage infrastructure, the unorganized sector, and waste disposal. Public participation in trash management raises serious challenges as residents often don't take responsibility for their waste. To create effective and sustainable waste management systems, it is essential to raise community awareness and alter people's attitudes toward garbage.

